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ABSTRACT

This study investigated the effectiveness of Project PRIME TIME on student learning in rural Indiana schools. Project PRIME TIME, a state-supported program to reduce class size in kindergarten through third-grade classes, was implemented in Indiana schools during the 1984-85 academic year. Subjects were first-graders enrolled in rural schools in western Indiana. Class sizes ranged from 15 to 22 students during the 1984-85 school year. Student scores on the Iowa Test of Basic Skills, Stanford Achievement Test, Metropolitan Achievement Tests, Gates MacGinitie Reading Test, Art is Fundamental, and locally prepared basic skills tests were analyzed to determine whether differences existed between classes before and after the introduction of Project PRIME TIME. Results indicated that, of 73 statistical test scores analyzed, 39 showed significant positive effects of the project, while 30 showed no significant differences. Only four test scores showed significant positive differences in favor of larger classes. It is concluded that state sponsored programs to reduce class size can benefit student achievement and teacher efficiency in the primary grades. (CB)

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THE EDUCATIONAL EFFECTS OF THE INTRODUCTION OF A STATE SUPPORTED PROGRAM OF SMALLER CLASSES

A Study of the First Year of Indiana's Project PRIME TIME and Its Effects on Test Results (1984-85)

A Comprehensive Analysis by
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Teacher effectiveness and student achievement have been among the most important issues in education in the 1980's. One method to increase teacher effectiveness and student achievement is the reduction of class size. Opinion polls (Educational Research Service, Inc., 1978) have consistently indicated that most teachers and the general public perceive that small classes are a major factor in student achievement. The state legislatures of both Indiana and Tennesse have allocated millions of dollars to programs which limit class size in elementary schools, especially in the primary grades.

There has been little hard data to substantiate the advantages of smaller class size in the primary grades. However, arguments in favor of smaller class size have centered around the following points. Individual attention to each student is possible when 20 or fewer students comprise the classroom. Thus, the amount and quality of teacher to student time is increased. Teachers have more time to plan, diversify, and individualize instruction and are able to better monitor student progress. More space is available in the classroom to use different instructional activities. Less discipline problems occur and there is more student-teacher interaction. The outcome of these factors is thought to result in higher teacher morale and increased interest in teaching. These attitudes come from the feeling of being in control of a classrooom that is more efficient in meeting the needs of students.

Smith and Glass (1980) have indicated that because of the cost of decreasing class size, justification should be shown to the policy makers that increased achievement does, in fact, occur. There is research to indicate that low class size in elementary schools has contributed to increased achievement and mastery of more subject content (Bozzomo, 1978).

Although logic supports the advantages of smaller class size in improving instruction and achievement, research studies have not provided conclusive evidence.

Several researchers have attempted to survey and summarize the data available concerning class size and its effect on student achievement. Cacha (1980) surveyed research findings concerning the relationship between class size and achievement. Contradictory findings were reported with some studies finding no relationship between class size and achievement while other studies favored smaller class size. The Educational Research Service (1978) reported considerable and consistent research to provide evidence that reducing class size alone does not increase achievement. Shapson, Wright, Eason, and Fitzgerald (1980) supported these findings.

There are a number of reasons that could contribute to whether there is increased achievement in a small class. Instructional methods utilized in the classroom seem to be an important variable in the controversy. Wexler (1980) cites a study funded by the National Institute of Education in 1978-79, in which it was concluded that class size increased achievement when teachers took full advantage of the opportunities to do more with fewer students. Cacha (1982) discovered that few, if any, benefits could be expected if teachers used the same instructional methods and procedures in smaller classes that were used in larger classes. Shapson et al. (1980) considered teachers' opinions, attitudes, and instructional methods to be just as important as class size. They felt that instead of concentrating on reducing class size, emphasis should be placed on more effective teaching strategies and training. Down (1979) also reported that class size is less important than teaching quality.

In 1981, Project PRIME TIME, a state supported program to reduce class size in kindergarten through the third grade, was adopted by the Indiana Department of Education. The first year effort was to reduce class size to eighteen or below in the first grade during the 1984-85 school year. Results of a pilot study (Indiana State Department of Education, 1983) indicated that there were significant gains in student learning of basic skills to be expected from class size reductions. After two semesters,

61 percent of the PRIME TIME children exceeded normal achievement in reading and 53 percent exceeded it in math (Seva, 1984). These numbers were considerably higher than those experienced by their larger class cohorts. Seva also reported that teachers reported better discipline and fewer behavior problems in PRIME TIME classes, while teacher effectiveness increased.

The PRIME TIME pilot study may have been flawed since the teachers in the study were carefully chosen. It is also possible that the publicity surrounding the pilot study caused teacher expectation to be high and thus produced a reactive effect that produced spuriously high posttest scores.

It should be noted that while several variables were measured in the pilot study, only those that produced significant results in favor of PRIME TIME were reported. The Indiana Department of Education has been reluctant to have PRIME TIME results evaluated by a statewide study. The only attempt to evaluate PRIME TIME at this writing has been the subjective judgments of six evaluators carefully chosen and controlled by Department of Education staff. A plan for a fifteen year longitudinal study to evaluate the effects of PRIME TIME was abruptly cancelled by PRIME TIME officials. It is fair to say, however, that the Department of Education is currently sponsoring one study of the effects of PRIME TIME.

In Indiana, PRIME TIME was implemented during the 1984-85 school year. However, it was not implemented on a uniform basis. Some teachers received inservice training in small class teaching strategies while others did not. In some schools, teachers were given larger classes (over 24 students) and provided with aides instead of having class size reduction. Some aides were trained and others were not. In some small communities PRIME TIME did not actually reduce class size.

Another variable in the project is teacher experience. Some schools hired seasoned teachers for PRIME TIME classes while others hired beginning teachers to reduce the additional cost of PRIME TIME. In addition, the enthusiasm of the school 's administration toward reducing class size varied.

In most school systems, there was no formal evaluation of PRIME TIME. However, in some school systems, it was communicated to teachers that gains in student achievement were expected. In some cases, teachers were informed of evaluative studies to be conducted at the year's end and in other cases the evaluation was unannounced. These factors may have motivated PRIME TIME teachers to succeed, particularly since gains in achievement were sometimes coupled with the potential reward of the continuation of smaller classes.

Statement of the Problem

The purpose of this study is to relate information concerning investigations of the effectiveness of PRIME TIME on student learning in rural Indiana schools. These investigations were based on the supposition that when class size is reduced, the mean scores of first grade students for the 1984-85 PRIME TIME school year would be higher than the mean scores of students for the 1983-84 school year when larger classes were still in effect.

The sample for the study was a purposive one. Schools and school systems were involved in the study if (a) they administered the same achievement test to first grade students in both academic years, (b) they were willing to release the records for study, and (c) there were personnel in the school system who were willing to supply the data to be used in the study to the investigators. The data has been synthesized. This synthesis forms the basis for this report.

Method

Subjects. Subjects were first grade students enrolled in rural schools in western Indiana. Students were enrolled in schools with first grade class size of from 15 to 35 students during the 1983-84 school year. Class sizes were from 15 to 22 during the 1984-85 school year. Scores for the studies were derived from school records of twenty-one school communities. A total of 11,876 scores were obtained from the 1983-84 and 1984-85 academic years for 2,924 subjects. However, in some schools, aides were utlized to teach PRIME TIME classes of from 19 to 31 students.

Tests. Measures of achievement were the actual tests administered by the school corporation to ascertain student proficiency at the end of the first grade. Results were obtained from the Iowa Test of Basic Skills (ITBS), the Stanford Achievement Test (SAT), the Metropolitan Achievement Tests (MAT), Gates MacGinitie Reading Test (G-M), Art is Fundamental (ART), and locally prepared basic skills tests (local). A total of seventy assessments were conduted by the local schools to determine whether differences existed between classes before and after the introduction of PRIME TIME.

Procedure. Research students obtained the school records for their class individual research projects. Data analysis was completed under supervision of their instructors.

Analysis. Scores for the tests were either raw scores, normal curve equivalent scores (NCE), or stanines. Means for classrooms were computed and subjected to whichever statistical test, t-test or analysis of variance (ANOVA), was appropriate. Results were tested for significance at the .05, .01, .001, and .0001 levels.

Results

The results of the study are contained in the Table. From that table, it can be ascertained that of the 73 statistical tests computed, 39 were significant in favor of PRIME TIME, 30 produced no significant differences between the two groups, and only four showed the "large class" to be significantly higher than the smaller PRIME TIME group. It is noteworthy that each of these four cases involved a teacher and an aide teaching a larger class in the PRIME TIME program than the teacher instructed the previous year.

Of particular note is the comprehensive analysis of the PRIME TIME project of the North Gibson School Corporation where all variables were clearly in favor of the PRIME TIME classes. The only differences favoring the larger classes was found on a locally prepared mathematics test results of one school and the ITBS test results from another school. In these schools, the large class was taught by a single teacher. During the PRIME TIME year, the classes were taught by that same teacher who was assisted by an aide.

Discussion, Conclusions, and Recommendations

Since 40 of the statistical tests favored PRIME TIME classes and only four favored the larger classes, it can be concluded that Indiana's PRIME TIME program was largely successful during its initial year. These results are overwhelmingly in favor of the smaller size PRIME TIME classes. However, the results should be viewed with caution because of three significant intervening factors. They are as follows:

1. There may have been reactive effects due to the Hawthorne effect and self fulfilling prophesy. Teachers may have been motivated to try harder in order that the PRIME TIME program could succeed. The anticipated results of better success for the small classes were such that teachers were able to more conscientiously instruct students in order to obtain the prophesized results.

2. In some school districts, teachers were informed that a summative evaluation would be conducted at the end of the school year. This may have provided them with an opportunity to teach toward the evaluation and may have also provided them with motivation to cause PRIME TIME to succeed since its failure could result in the punishing outcome of a return to larger classes.

3. Indiana's PRIME TIME program's initial year was also the year of a greater emphasis on Time on Task. During the first year of PRIME TIME, schools were required by the State Board of Education to devote more time to instruction in the basics. Some rural school districts increased their school day or school year to accomplish the State's directives.

This study reported no indication that class size is of necessity tied to a change in instructional methodology since most teachers had no additional training and most reported no change in their instructional strategies. There is some evidence to indicate that school districts with high standards of achievement, such as the North Gibson School Corporation, can substantially benefit from reducing class size in the primary grades.

The study found no evidence of the necessity to reduce class size to a magic number of 14 before benefits can occur.

Most of the studies were of the expost facto variety in that the data was collected after the completion of one year of PRIME TIME and nobody was aware that the evaluation of PRIME TIME was to be conducted. However, when PRIME TIME was accompanied by a planned program of summative evaluation, the results were particularly spectacular.

While reducing class size may benefit student achievement, the results of providing an aide in the classroom are unpredictable. Four studies actually showed a significant difference favoring "large class" instruction with a single teacher as opposed to providing the teacher with an aide. Most studies involving aides instead of actual class size reduction showed no significant differences.

In many small schools there was no actual reduction in class size as a result of PRIME TIME. It was usually the case that nonreduction in class size caused no noticeable change in mean scores. In some cases, class sizes were larger in PRIME TIME classes than during the previous years.

As Indiana's PRIME TIME program continues, it will be necessary to examine its various alternatives to determine which factors benefit students in a state sponsored program to reduce class size. However, these studies clearly indicates that state sponsored programs to reduce class size can benefit student achievement and teacher efficiency in the primary grades.

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TABLE
Data Summary by School

School	Test	Subtest	Data	N	Average Class Size		Gain (Loss)	Statistical Test	Signifi-cance
					Large Class	PRIME TIME			
Barr Reeve Elementary	ITBS	Math Reading Composite	Raw Score	117	30.0	19.0	5.7 4.2 6.9	t-test	.05 .05 .05
Central Greene Elementary	ITBS	Math Reading Composite	N.C.E.	57	26.0	16.0	22.8 14.3 17.6	t-test	.001 .001 .001
	Local	Math Reading	Raw Score				5.4 6.8	t-test	.01 .01
	Local	Math Reading	Percent Mastery				(-.2) (-.2)	t-test	n.s n.s
Crestview Elementary	MAT	Math Reading Composite	Raw Score	191	30.7	16.3	1.9 (-0.9) 1.1	t-test	n.s n.s n.s
Lena Dunn Elementary of Washington*	ITBS	Math Reading Composite	Raw Score	318	20.0	16.7	1.0 7.0 4.0	t-test	n.s. .01 .05
East Elementary*	ITBS	Math Reading Composite	Stanine	77	18.5	20.0	(-1.0) (-1.0) (-0.5)	ANOVA	-.05 -.05 -.05
Griffith Elementary of Washington*	ITBS	Math Reading Composite	N.C.E.	43	24.0	13.0	5.9 15.5 11.4	t-test	n.s .01 .001
Ireland Elementary	G-M	Vocabulary Reading Comprehension	N.C.E.	548	29	15	9.0 7.4	t-test	.01 .01
	Local	Math sem. 1 sem. 2 Read- sem. 1 ing sem. 2	Raw Score				0.0 .7 (-1.3) (-.4)	ANOVA	n.s n.s n.s n.s
Jackson Township Elementary of Clay County	SAT	Math Reading	N.C.E.	42	24.0	18.0	8.2 5.2	t-test	n.s n.s

TABLE
Data Summary by School
(continued)

School	Test	Subtest	Data	N	Average Class Size		Gain (Loss)	Statistical Test	Signifi-cance
					Large Class	PRIME TIME			
Jasper Tenth Street Elementary	ART	Art	Raw Score	56	34	22	1.2	t-test	.01
L and M Elementary*	Local	Math Reading	Raw Score	58	27	31	0.4 (-5.2)	t-test	n.s .05
Loogootee Elementary	ITBS	Math Reading Composite	G.E.S. (months)	190	25.0	18.0	0.3 1.7 0.1	t-test	n.s n.s n.s
North Elementary Washington	ITBS	Math Reading Composite	N.C.E.	87	20.5	15.3	(-2.8) 4.9 4.0	t-test	n.s n.s n.s
North Gibson School Corporation	ITBS	Math Reading Composite	N.C.E.	394	23.8	17.5	11.7 9.3 17.9	ANOVA	.001 .001 .001
	Local	Math Reading	Raw Scores				7.3 8.0	ANOVA	.0001 .0001
	Local	Math Reading	Skills Mastered				3.3 3.0	ANOVA	.001 .001
	Local	Self-Concept Attitude toward School Total Affective	Raw Scores				 5.1 0.4 2.7	ANOVA	 .001 .01 .001
North Knox School Corporation*	ITBS	Math Reading Composite	N.C.E.	148	19.5	19.4	(-2.7) (-1.3) (-1.4)	ANOVA	n.s n.s n.s
North Newton School Corporation	ITBS	Math Reading Composite	N.C.E.	330	21.0	16.5	3.2 (-0.1) 0.0	ANOVA	n.s n.s n.s

TABLE
Data Summary by School
(continued)

School	Test	Subtest	Data	N	Average Class Size		Gain (Loss)	Statistical Test	Signifi-cance
					Large Class	PRIME TIME			
Petersburg Elementary	ITBS	Math Reading Composite	N.C.E.	90	20.7	14.0	5.5 7.1 2.7	ANOVA	.01 .05 .05
St. Patrick's of Terre Haute	ITBS	Math Reading	N.C.E.	48	24.0	24.0	12.6 15.7	t-test	.05 .05
South Knox School Corporation	ITBS	Math Reading Composite	N.C.E.	201	21.0	14.0	2.9 (-1.0) (-1.3)	ANOVA	n.s n.s n.s
South Spencer	ITBS	Math Reading Composite	N.C.E.	236	24.3	18.8	14.3 1.5 8.0	ANOVA	.0001 n.s .01
Springs Valley	SAT	Math Reading Composite	N.C.E	129	13.0	14.0	10.1 12.0 10.3	t-test	.01 .01 .01

* Indicates PRIME TIME class was taught by a teacher and an aide.